

Notice of Allowability

Application No.

10/828,953

Applicant(s)

MCCULLOUGH, LAUGHLIN
GERARD

Examiner

Rip A. Lee

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to January 24, 2005.
2. ☒ The allowed claim(s) is/are 1-5 and 7-11.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Claim 11, line 1 replace "10" with "9"

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Claims 1-5 and 7-11 are allowed over the closest reference, U.S. 2001/0034298 to Isobe *et al.*

The present invention is drawn to a method of producing an ethylene/1-hexene copolymer in a fluidized bed gas-phase reactor by combining therein ethylene and 1-hexene, an activator and a metallocene catalyst compound. The conditions are such that as the mole ratio of 1-hexene to ethylene is varied in the reactor between 0.015 to 0.05, the density of the resultant polyethylene changes by less than 5 % and the I_{21}/I_2 ratio varies from 10-150. The metallocene compound is a mixed ring group 4 metal organometallic comprised of a cyclopentadienyl ligand and a substituted tetrahydroindenyl ligand (see claim for structural details).

The prior art of Isobe *et al.* teaches process for polymerization using a catalyst comprised of a metallocene, an activator, and an ion-exchangeable layered inorganic compound as the support/carrier. Use of mixed ring metallocenes such as 2-methyltetrahydroindenyl(Cp)ZrCl₂, 2-ethyltetrahydroindenyl(Cp)ZrCl₂, 4-methyltetrahydroindenyl(Cp)ZrCl₂, 2,4-dimethyltetrahydroindenyl(Cp)ZrCl₂, and 2-methyl-4-phenyltetrahydroindenyl(Cp)ZrCl₂ is prescribed. The inventors contemplate polymerization reactions carried out in the absence of solvent at a temperature of up to 250 °C, and those olefins usable in the polymerization include ethylene and C₃-C₈ α-olefins.

It is deemed that the subject matter of the present claims is not disclosed to an adequate degree that one skilled in the art would immediately envision the same

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embodiment. It is further noted that the teachings of the prior art do not render the invention of the present claims obvious to one of ordinary skill in the art. First, the reference does not teach specifically a process involving fluidized bed gas phase ethylene/1-hexene copolymerization under the conditions noted in the present claims. Secondly, one of ordinary skill in the art would need to select the specific mixed ring organometallics out of a substantially large listing of compounds. Although it may be argued that use of these compounds is obvious since they are recited, it is maintained that one of ordinary skill in the art would not find it obvious to use these particular compounds in a gas phase process in light of the illustrated embodiments in which a different class of compound is used in a solution process.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).



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February 19, 2005


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SUPERVISORY PATENT EXAMINER
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